



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/936,122	09/06/2001	Thomas Bieringer	MO-6585/LEA 33,633	9409
157	7590	05/25/2005	EXAMINER	
BAYER MATERIAL SCIENCE LLC			ANGEBRANNDT, MARTIN J	
100 BAYER ROAD			ART UNIT	
PITTSBURGH, PA 15205			PAPER NUMBER	

1756

DATE MAILED: 05/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/936,122	Applicant(s) BIERINGER ET AL.	
	Examiner Martin J. Angebranndt	Art Unit 1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23 and 24 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23 & 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

PD

Art Unit: 1756

1. The response provided by the applicant has been read and given careful consideration.

Rejections of the previous office action not repeated below are withdrawn based upon the amendments and arguments of the applicant. Responses to the arguments of the applicant are presented after the first rejection to which they are directed.

2 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3 Claim 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bieringer et al. '846, in view of Savant et al. '221, Kawano et al. '890 and Colvin et al. '648 and further in view of Ross '663.

Bieringer et al. '846 disclose azo monomers embraced by formula II in columns 4-6. See the liquid crystalline monomers, which exhibit shape anisotropy in columns 6-7. See also general formulae I and II. The recording of holographic images (gratings) is disclosed. (9/37-41) and the images are described as changing the refractive index (birefringence), which makes them volume images, rather than surface images (9/42-51). The formation of films of thicknesses of 0.1 and 1 mm is disclosed. (21-23). The use of copolymers is shown in polymers 4, 6-8, and 10-12 using azo monomer 7. The use of injection techniques is disclosed. (inflow). The copolymerization of the monomers containing photoactive side chains with other ethyleneically unsaturated monomers, such as acrylates and methacrylates is disclosed. (7/48-8/28).

Savant et al. '221 in example IV uses dye concentrations of 4.5 to 25% in polyvinyl alcohol. Examples V describes the azo dyes bound to a polyethylene vinyl alcohol backbone and

Art Unit: 1756

coated to a thickness of 10 microns. Examples XIII to XX describe thicknesses of 10 to 150 microns (0.1 to 0.15 mm) with dye loading concentrations of 10% as the best (23/53-55). The storage of multiple holograms in the same spot by controlling the angle between the incident (object) and reference beams is disclosed. (25/46-57 and 7/11-15). Suitable polymers are disclosed in columns 8-10. Useful azo dyes are disclosed in columns 9-17. The formation of thicknesses of 10-1000 microns (1 mm) by spin coating is disclosed. (18/51-66). The images induced are based upon birefringence (26/6-23). The formation of 32 different patterns per spot is disclosed. (7/11-18)

Kawano et al. '890 teach azo used in holographic recording media to record polarization sensitive holograms. The use of thicknesses of at least 10 microns is disclosed. There is a preference that they be thicker to store more information, with 1 mm thicknesses able to store as much as 100 DVDs. (8/30-34).

Colvin et al. '648 teach that as thickness increase so does the diffraction efficiency of the medium and the ability to store more holograms due to facilitating Bragg angle selection (angular multiplexing).

Ross '663 teaches holographic recording media which are 1 cm thick in the examples.

It would have been obvious to one skilled in the art to modify the examples of Bieringer et al. '846 cited by angularly multiplexing holograms during recording and reading them out to increase the amount of information recorded in the hologram, thereby increasing its utility as taught by Savant et al. '221 and Colvin et al. '648 and to increase the thickness of the recording media to at least 1 mm as taught by Kawano et al. '890 and Colvin et al. '648 to increase their potential diffraction efficiency and their ability to angularly multiplex holograms during

Art Unit: 1756

recording and read out thereby increasing the amount of information recorded in the hologram and its utility. Further it would have been obvious to use either angular multiplexing or polarization multiplexing to record several holograms in the same portion of the resultant medium and to use thicknesses of up to 1 cm as taught by Ross '663 to based in part upon the direction to thicker media to allow more storage capacity as taught by Kawano et al. and Colvin et al. '648.

The applicant correctly argues that multiplexing of holograms is not taught in Bieringer et al. '846, but the examiner does to base the rejection merely upon Bieringer et al. '846. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The examiner has relied upon Savant et al. '221, Kawano et al. '890 and Colvin et al. '648 to teach multiplexing as allowing increased amounts of information to be able to be stored in the same recording medium and specifically Savant et al. '221 and Kawano et al. '890 to show that this is known for azo dye based holographic recording media. Savant et al. teaches the **storage of multiple holograms in the same spot** by controlling the angle between the incident (object) and reference beams is disclosed (angular multiplexing). This is different from the successive overwriting by erasure as evidenced by the text. The examiner notes that the effects of thickness on the capacity of volume holographic recording media is recognized in the art and the Ross '663 is a volume holographic recording medium and establishes useful thicknesses include 1 cm. The applicant is arguing that with increased thickness, optical density becomes an issue. The examiner notes that this is much

Art Unit: 1756

less of a problem when polarization of the beams is used as only a fraction ($\sim 1/3$) of the azo sidechains would be in the appropriate orientation to absorb the incident light (their dipole moments have to be parallel to the electric field of the polarized light). The examiner also notes that references cited do not require that the wavelengths used be at the absorption maxima of the polymeric azo dyes, but only that the light be absorbed which reduces the effects of any alleged high absorptivity. Also the teachings of Ross et al. is that thicknesses of up to 1 cm would be expected to be useful. If the applicant has data/evidence that this is not the case, then it should be made of record. The rejection stands.

4 THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

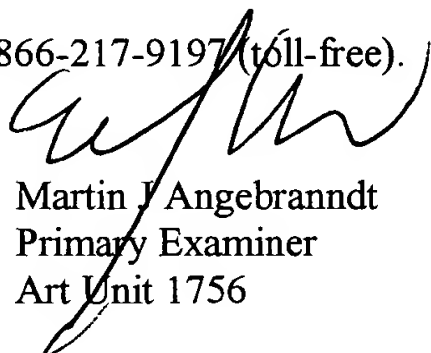
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

5 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

Art Unit: 1756

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Martin J. Angebranndt
Primary Examiner
Art Unit 1756

10/05/2004